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COUNTRY ANALYSIS BRIEFS

Central Asia

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Central Asia countries Turkmenistan and Uzbekistan have abundant oil and natural gas reserves. A lack of sufficient foreign investment, geographical challenges, inadequate export pipeline infrastructure, and political instability have been deterrents of both countries becoming major energy exporters. Recent agreements with international companies and countries may help Turkmenistan and Uzbekistan to find alternative export routes outside of Russia and leverage their hydrocarbon competitiveness in the region.

Background

Central Asia is loosely defined as including the countries of Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, and Afghanistan. The energy sectors of Turkmenistan and Uzbekistan are covered briefly in the Caspian Sea Region Brief, but this report discusses these two countries' growing energy sectors in greater detail.

Turkmenistan and Uzbekistan sit on large reserves of oil and natural gas, yet both countries face a myriad of challenges in bringing those reserves to world markets. Both countries are geographically far from the end-use markets they serve and lack sufficient pipeline infrastructure to export more hydrocarbons. Also, other hydrocarbon-rich Central Asian and Caspian states with more favorable investment climates and greater access to markets pose competition for Turkmenistan and Uzbekistan. Both countries are eager to diversify export routes for their resources outside of the Russian-controlled pipelines, but each must seek to obtain capital, technical assistance, and political support for alternative pipelines.

The most recent political shift in the region, the death of former President Saparmurat Niyazov (also referred to as Turkmenbashi) in December 2006 and the election of Gurbanguly Berdymukhammedov in early 2007 have sparked new interest and hope for a stable environment for foreign investors in Turkmenistan's oil and gas sector. Turkmenistan's new leadership is renewing diplomatic relations with Russia, China, Europe, the US, and other Central Asian neighbors after 15 years of isolation. Foreign energy firms experienced extreme political challenges and investment impasses during Niyazov's era, and several exited the country leaving a dearth of investment. Since Berdymukhammedov became president, there have been modest signs of a more business-friendly environment, and international competition for Turkmenistan's hydrocarbon industry has intensified. Please consult the U.S. Department of State (and the links below) for more information on the political and economic situations of Turkmenistan and Uzbekistan.

Oil

Oil production from Turkmenistan and Uzbekistan has declined since 2004 due to lack of new investment and technical capacity to bring new oilfields online. Disputes among the littoral Caspian Sea countries on boundaries could challenge Turkmenistan's ability to access a significant portion of its total oil reserves.

Turkmenistan's Oil Sector

Turkmenistan has proven oil reserves of roughly 600 million barrels based on estimates by *Oil and Gas Journal*, although IHS claims probable and possible oil reserves are over 2 billion barrels plus 6 billion barrels of undiscovered reserves. Most of the country's oilfields are situated in the South Caspian Basin and the Garashyzlyk onshore area in the west of the country. Turkmenistan's oil production has rebounded since it obtained independence from the Soviet Union, increasing from 110,000 bbl/d in 1992 to approximately 214,000 bbl/d in 2004 before trending down to 180,000 bbl/d in 2007. The government has frequently targeted higher oil production, but the oil sector struggles to meet its growth goals due to a shifting interest to gas production, lagging foreign investment in this sector, and heavy competition for investment within the Central Asian region. According to previous reports in 2007, Turkmenistan aims to produce 2.2 million bbl/d by 2030. The Turkmen government recently announced plans to produce 216,000 bbl/d in 2008, though this amount is higher than the 190,000 bbl/d projected by EIA. Turkmenistan exports roughly 40 percent of its production. Local consumption is estimated at 110,000 bbl/d according to EIA and is subsidized by the Turkmen government. In February 2008, Berdymukhammedov instituted a new retail fuel system providing transportation customers with free gasoline up to a specified allocation (120 liters per month for car owners) and charging a market rate, established by the government, for any amounts exceeding the quota.

Foreign investment is limited to joint-ventures (JVs) and production-sharing agreements (PSAs) with Turkmenneft, the state-owned oil company, and has typically been concentrated on offshore oil projects in the Caspian Sea with a few small onshore fields by mid-sized international oil companies. Burren Energy (purchased by Eni in January 2008) produced over 20,000 bbl/d at the onshore Nebit Dag field during the first half of 2007. Petronas (Malaysia) began producing 10,000 bbl/d from the Diyarbekir field in 2006. Output from the offshore Cheleken block operated by Dragon Oil's (UAE) and Turkmenneft averaged 32,000 bbl/d in 2007 and reached record production of 40,000 bbl/d in October 2007. Dragon Oil plans to invest more than $600 million in the contract area in 2008. Mitro International currently produces 7,000 bbl/d from the East Cheleken onshore fields. The consortium of Maersk Oil (Denmark), Wintershall (Germany), and ONGC (India) and the Zarit Consortium signed PSAs with Turkmenistan in recent years and other firms such as BP, Chevron, Buried Hill Energy, Lukoil, and ConocoPhillips are eager to explore and develop Caspian Sea blocks.

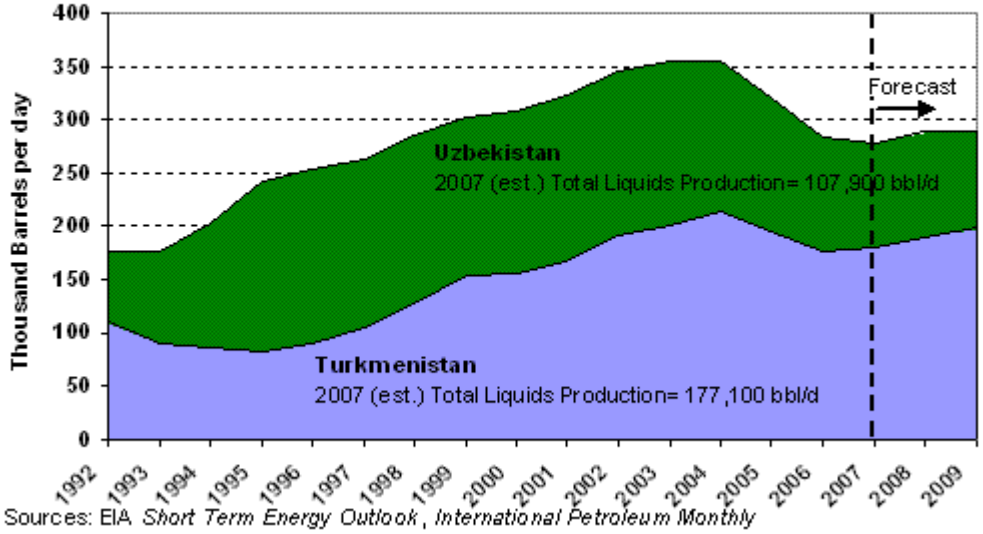
Many of the prime oil deposits are located in disputed areas of the Caspian Sea, and without an agreement between Iran, Azerbaijan, and Turkmenistan on maritime borders, these fields will likely remain undeveloped. In 2007, Chevron began negotiations with Turkmenistan on the disputed Kyapaz-Serdar oil and gas field linking Turkmen and Azeri maritime borders in the Caspian Sea, and in February 2008, Buried Hill claimed that it signed a PSA with the Turkmen government to begin production from this field. The field holds an estimated 700 million barrels of reserves according to some press reports. Turkmenistan is currently in political discussions with Azerbaijan.

Turkmenistan Hydrocarbon Legislation and Investment

President Berdymukhammedov is taking steps to improve the legal policies and institutional capacity to facilitate investment in the hydrocarbon industry; though, it is still too early to determine how much progress the new regime will make towards opening its hydrocarbon market and increasing transparency related to information and reserve audits. In March 2007, Turkmenistan's new government established a hydrocarbon regulatory authority separate from the central government to provide greater revenue transparency and initiate more foreign investment. Turkmen officials hope to attract $46 billion in hydrocarbon-sector investment by 2010, and the country allocated about $3 billion in 2007. The European Bank for Reconstruction and Development (EBRD) estimates 2007 foreign direct investment (FDI) levels at $753 million.

Historically, Turkmenistan has been protective of its onshore basins, allowing foreign companies to participate in only offshore developments. While President Berdymuhammedov has been receptive to foreign participation, primarily from Russian and Asian firms in onshore fields during 2007, he invited several companies to develop the prolific Caspian basins.

Fig. 1: Oil Production in Central Asia (1992-2007)



Sources: EIA *Short Term Energy Outlook*, *International Petroleum Monthly*

Uzbekistan's Oil Sector

The *Oil and Gas Journal* estimates that Uzbekistan has 594 million barrels of proven oil reserves, with 171 discovered oil and natural gas fields in the country. The majority of the known oil fields in Uzbekistan are in the Bukhara-Khiva region, including the Kokdumalak field, which accounts for about 70 percent of the country's oil production. The country also has oilfields in the Ferghana valley region in the northeast, the Ustyurt plateau, and the Aral Sea. The Ferghana Basin, bridging Uzbekistan, Kyrgyzstan and Tajikistan, contains reserves of 1.2 billion barrels and possibly up to 4 billion barrels including undiscovered reserves according to the USGS. Most of Uzbekistan's petroleum production consists of about 60 percent high-sulfur crude and 40 percent gas condensate. Existing fields are depleting faster than new discoveries are coming online, spurring the need for further investment.

Uzbekistan was temporarily self-sufficient in oil production in the late 1990s until oil production dropped. During 2007, estimated total liquids production in Uzbekistan averaged 100,000 bbl/d, a 30 percent decline since 2004, and with consumption at 156,000 bbl/d in 2007, the country is a net oil importer. Despite having reserve levels similar to those of Turkmenistan, Uzbekistan produces significantly less oil due to lack of investment in new upstream reserves and few export options. According to *APS Review* (October 2006), oil liquids production could fall to 50,000 bbl/d by the end of the decade without significant investment in the upstream sector. Since retail prices are subsidized, as long as production declines continue, Uzbekistan runs a risk of continuous shortage of oil products.

Uzbekistan has made several bilateral agreements with foreign oil companies, especially ones from Russia and Asia. In April 2001, Uzbekneftegaz signed its first PSA with Britain's Trinity Energy (through a specially formed subsidiary known as UzPEC Ltd, now controlled by Soyuzneftegaz). The $400 million project entails the development of fields in Uzbekistan's central Ustyurt and Southwest Gissar regions. However, Uzbekneftegaz cancelled the PSA in February 2005, alleging that UzPEC had not met conditions specified in the PSA. The parties signed a new PSA in February 2007, and Soyuzneftegaz agreed to invest $462 million. In June 2005, CNPC agreed to form a $600 million, 25-year JV with Uzbekneftegaz, the state oil and gas holding company, to develop primarily small oilfields in the Bukhara and Khiva regions. Combined, these oilfields will produce about 20,000 bbl/d by 2015. Petronas signed a PSA and exploration agreement with Uzbekneftegaz in 2008. Under the PSA, Petronas will be a 100 percent equity owner and operator to develop hydrocarbon resources in the Baisun Block. Uzbekistan also signed several energy cooperation agreements with other Asian companies such as India's GAIL involving them in technical discussions of exploration and development efforts in the country.

Despite gradual steps to improve its foreign investment climate, Uzbekistan still faces serious hurdles to develop its hydrocarbon sector. Sinopec rescinded a $106 million deal to rehabilitate existing oilfields with Uzbekneftegaz in 2007 on account of high investment costs and resource taxes.

Uzbekistan Hydrocarbon Legislation and Investment

Uzbekistan has one of the lowest FDI levels in the former Soviet Union, and investment for the hydrocarbon industry is currently insufficient to raise oil production. According to the EBRD, total FDI for 2007 is estimated at $260 million; however the Uzbek government reports a higher FDI of $693 million. The discrepancy could be due to a difference in the types of investments included. Also, only $114 million was slated for investment in 2005 for oil and gas exploration according to an International Crisis Group report. The Uzbek government has invested about $2 billion of mostly commercial and export credit loans in the hydrocarbon sector since 1991. In order to boost foreign investment, Uzbekistan recently has taken various steps such as reversing its previous tax level increases on subsoil hydrocarbon production in 2007 (now 20 percent and 30 percent tax for crude and gas production, respectively) and modifying its regulations for PSA developments. In addition, Uzbekistan has attempted to privatize Uzbekneftegaz several times since 2003, but its desire to maintain majority control over the company is thwarting its plans to attract foreign investors.

Downstream/Refining

Turkmenistan has two major refineries, the Seidi (Chardhzou) and Turkmenbashi, with a combined total capacity of 237,000 bbl/d. Turkmenistan's refinery system is underutilized and processes crude oil at about 50 percent of capacity. The Turkmenbashi refinery was upgraded in 2002, and in 2004, the Turkmen government announced plans to upgrade the Seidi refinery which processes only high-sulfur crude. In March 2007, Dragon Oil commissioned the first foreign-owned refinery with a capacity of less than 50,000 bbl/d.

Uzbekistan has three refineries, at Ferghana, Alty-Arik, and Bukhara, with a total refining capacity of 222,000 bbl/d. The $400 million Bukhara refinery has a capacity of 50,000 bbl/d, although it is expected to expand to 100,000 bbl/d and refine both crude oil and gas condensate. Due to the

country's decline in oil production in recent years, Uzbek refineries are operating at only 60 percent of design capacity. Uzbekistan's limited refined product exports move by rail and road to neighboring countries and to export ports on the Black Sea.

Regional Oil Transport

Oil export options for Turkmenistan and Uzbekistan are limited. Turkmenistan has almost no international oil pipelines apart from an import pipeline in the east running from Kazakhstan, meaning that all crude oil exported from the country is shipped across the Caspian Sea.

The actual amount of Turkmenistan's total petroleum exports is debatable, though a large share is in the form of refined products. According to *APS Review,* (October 2006) Turkmenistan exports up to 120,000 bbl/d of crude oil, condensates, and refined products. Turkmenistan ships a small amount of crude oil by tanker to Russia's Caspian Sea port of Makhachkala, however, securing pipeline access has been a problem due to the poor quality of some Turkmen crude.

In December 2001, Burren Energy opened a crude oil marketing route through Baku, Azerbaijan. Turkmenistan is increasing its oil product exports to the north-eastern Iranian market, shipping products from the Turkmenbashi refinery to the Iranian port of Neka. In addition, Dragon Oil began an oil swap deal with Iran's Naftiran Intertrade Co. (Nico), a NIOC subsidiary, in 1998. Under this agreement, Dragon Oil transfers over half of its crude oil production at Hazar, Turkmenistan and ships it to the Caspian port of Neka. Dragon then receives an equal swap volume of Iranian crude oil from the Persian Gulf for marketing to international third parties. As a result of Iran's upgrades to its distribution network and the Neka terminal, capacity increased from 50,000 bbl/d to 150,000 bbl/d, and the Neka to Tehran oil pipeline capacity rose to 300,000 bbl/d, facilitating more swap volumes from Central Asia and Russia. Iran intends to upgrade the pipeline capacity to 500,000 bbl/d.

Uzbekistan has virtually no international oil pipeline infrastructure except for a pipeline linking the Kazakhstani Shymkent refinery to the Chardzhou refinery in northeastern Turkmenistan. A smaller petroleum products pipeline linking Shymkent to Tashkent, the Uzbek capital, resumed imports for Uzbekistan in 2003. Uzbekistan's only current oil export option is to reverse an existing crude oil pipeline that brings oil from Omsk, Russia, to Uzbek refineries.

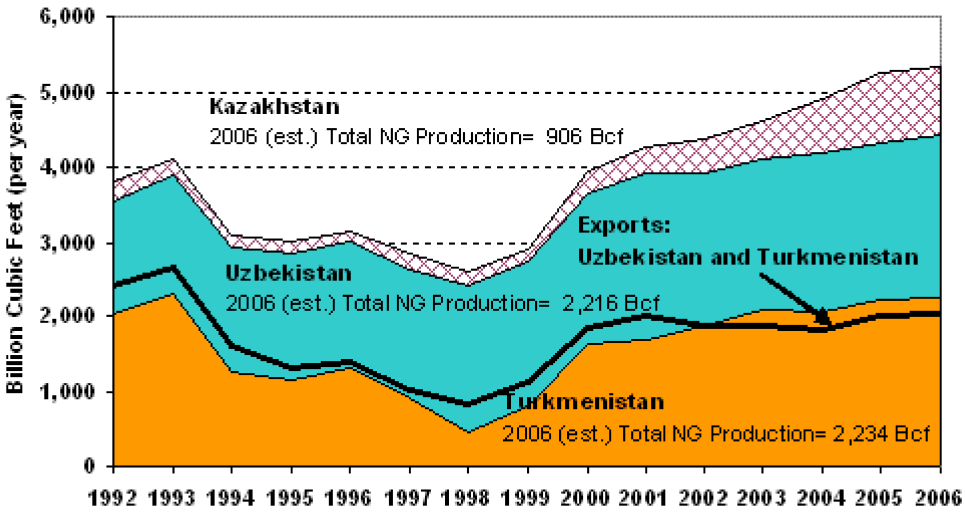
Natural Gas

Turkmenistan and Uzbekistan contain large amounts of natural gas reserves but are constrained by the lack of available natural gas transport infrastructure. Turkmenistan exports most of its natural gas production, while Uzbekistan continues to use its production for domestic purposes. Both countries expect to increase export volumes and diversify routes through recent agreements.

Turkmenistan's Upstream

Since the Soviet Union's collapse in 1991, Central Asian regional natural gas production has been characterized by modest annual increases from Uzbekistan, and by a collapse (then partial recovery) from Turkmenistan. After 1991, these fluctuations occurred because Turkmenistan was locked in pricing disputes with Russia and other countries until 1998 which resulted in Russia cutting access to its pipelines. Since all of the pipelines connecting the region to world markets were owned by Gazprom, Russia's state owned gas company, and routed through Russia, Turkmen natural gas was squeezed out of the market. As a result, Turkmenistan's ability to attract investment for existing field development disappeared. The country's output dropped throughout the 1990s, from 2 trillion cubic feet (Tcf) per year (57 Bcm/y) in 1992 to 466 billion cubic feet (Bcf) per year (13 Bcm/y) in 1998. In 1999, a Turkmen-Russian agreement took hold, and in 2000, production skyrocketed to 1.6 Tcf/y (47 Bcm/y) before reaching an estimated 2.2 Tcf/y (63 Bcm/y) in 2006, placing the country as the second largest gas producer after Russia in the former Soviet bloc. In May 2007, chairman of Turkmengaz, Yashygeldy Kakayev, said the country's energy strategy is to almost double gas production to 4.2 Tcf/y (120 Bcm/y) in 2010 and more than triple production to 8.48 Tcf/y (240 Bcm/y) by 2030. In early 2008, the Turkmen government announced that it plans to produce 2.6 Tcf/y (73 Bcm) of gas in 2008.

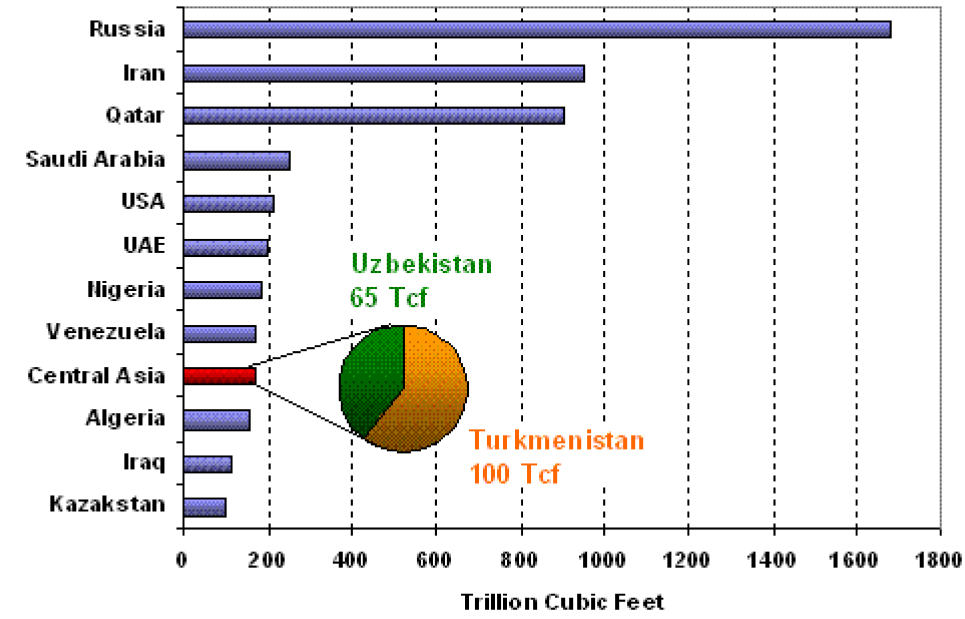
Fig. 2: Natural Gas Production in Central Asia (1992-2006)



Sources: EIA *International Energy Annual*

Turkmenistan has proven natural gas reserves of approximately 100 Tcf (2.83 Tcm) at the end of 2007, up from 71 Tcf (2 Tcm) in 2006 according to the *Oil and Gas Journal*. This reserve level ranks Turkmenistan among the top 12 countries in terms of natural gas reserves. Turkmenistan contains several of the world's largest gas fields, including 10 with over 3.5 Tcf of reserves located primarily in the Amu'Darya basin in the east, the Murgab Basin, and the South Caspian basin in the west. All major gas fields in Turkmenistan have been producing for more than a quarter century and are exhibiting signs of natural depletion. Most of the gas available for future exploration and development is sour gas which poses challenges for state-owned Turkmen firms as well as foreign investors.

Fig. 3: World Natural Gas Reserves by Country, January 1, 2008



Source: Oil and Gas Journal

The Turkmen government wants to produce offshore associated gas reserves from its section of the Caspian Sea. Some sources such as *Heren Energy* and Western Geophysical (US) estimate recoverable offshore reserves are over 210 Tcf (6 Tcm). Berdymukhammedov is in discussions with major companies such as Chevron, Total, Shell, Lukoil, Gazprom, Itera, and BP to explore and develop Turkmenistan's part of the Caspian shelf. Petronas, which has an oil and gas PSA

with Turkmenistan for the Diyarbekir field (Block 1), estimates that the field has 5.3 Tcf (150 Bcm) of reserves with production levels of up to 353 Bcf/y (10 Bcm/y) for 20 years, according to RPI Research. Also, Dragon Oil has 3.5 Tcf (100 Bcm) of gas reserves in the Cheleken field. A Russian consortium (Rosneft, Itera, Zarubezhneft) anticipates signing a PSA with Turkmenistan to develop several Caspian blocks.

The Dauletabad field, located in the Amu'Darya basin and which held about 60 Tcf (1.7 Tcm) of gas before being brought into production in 1982, has been deemed one of Turkmenistan's largest fields. In 1997, reserves at the field were independently certified at an estimated 25 Tcf (0.7 Tcm) by the U.S.-based consultancy, DeGolyer and McNaughton. In 2005, the firm was hired by the Asian Development Bank (ADB) to re-assess the field's reserves and its ability to support a Trans-Afghan pipeline project. The results have never been released publicly causing uncertainty for potential foreign investors.

In November 2006 and March 2007, Turkmenistan announced the discovery of the South Yolotan and the Osman fields, respectively. These fields are possibly a single geological field and located in the southeastern Murgab Basin, north of the Dauletabad field. Former President Niyazov asserted that South Yolotan was the largest field in the world with reserves of 240 Tcf (6.8 Tcm); however, most analysts believe this number to be significantly exaggerated. The reserve levels for both fields are extremely speculative. According to IHS, in 2006, Turkmengaz officially booked 1.4 Tcf (39.6 Bcm) of in-place gas reserves in South Yolotan. As reported in January 2008, Turkmenistan's state energy company is in discussion with an international company to perform audits of the Yolotan and Osman energy deposits. An affiliate of CNPC was awarded a $151 million 3-year drilling contract for 12 wells in South Yolotan in late 2006. Also, CNPC signed a PSA with Turkmenistan in July 2007 to develop the Turkmen sector of the Amu'Darya Basin including the Bagtiyarlyk field. CNPC anticipates transporting up to 1.1 Tcf/y (30 Bcm/y) of gas from these fields to a proposed pipeline traversing Central Asia to China starting in 2009.

Uzbekistan's Upstream

Uzbekistan has maintained natural gas production growth by avoiding Russia's pipeline system and by concentrating on the domestic market and exports to immediate neighbors. Holding estimated natural gas reserves of 65 Tcf (1.8 Tcm) according to *Oil and Gas Journal*, Uzbekistan is the third largest natural gas producer in the FSU (after Russia and Turkmenistan) and one of the top fifteen natural gas-producing countries in the world. Uzbekistan produces natural gas from 52 fields with 12 major deposits, including Shurtan, Kokdumalak, Gazli, Pamuk, and Khauzak, accounting for over 95 percent of Uzbekistan's natural gas production. These deposits are concentrated in the Uzbek side of the Amu Dar'ya Basin in the southeast and in the Ustyurt plateau in the western part of the country.

Since becoming independent, Uzbekistan has increased its natural gas production by nearly 40 percent, from 1.5 Tcf/y (42 Bcm/y) in 1992 to 2.1 Tcf/y (60 Bcm/y) in 2005. In 2006, Uzbek natural gas production increased to nearly 2.2 Tcf/y (63 Bcm/y). Uzbekistan's natural gas fields were heavily exploited in the 1960's and 1970's by the Soviet Union, and as a result several older fields, such as Uchkyr and Yangikazgan, are beginning to decline in production. In order to offset those declines, Uzbekistan is speeding up development at other fields, such as Garbi and Shurtan, as well as developing new fields and exploring for new reserves.

Similar to Turkmenistan, Uzbekistan's gas sector suffers from deficiencies of pipeline infrastructure in the region. Uzbekistan consumes a majority of its gas, and there are losses on the system due to pressure declines since the 1990s. Also, according to estimates from a World Bank commissioned study conducted by the National Oceanic and Atmospheric Administration's (NOAA), Uzbekistan currently flares nearly 105 Bcf/y (3 Bcm/y), 5 percent of reported production levels. Although Kazakhstan now flares three times the amount of gas as its Central Asian neighbor, Uzbekistan ranks as one of the top 20 gas flaring countries.

PSAs

Uzbekistan has signed several accords and PSAs with Russian and Asian companies. After resolving a dispute, Soyuzneftegaz (Russia) signed a new 36-year PSA with Uzbekneftegaz in February 2007 and intends to invest $462 million for development of gas fields in the Ustyurt plateau region and the Southwest Gissar blocks. In February 2008, Lukoil, another Russian energy company, acquired a controlling interest in this PSA and targets 106 Bcf/y (3 Bcm/y) of production. Gazprom has been getting more involved in revamping old fields in Uzbekistan and plans to boost natural gas exports from the country. Gazprom and Uzbekneftegaz signed an agreement on strategic cooperation in 2002 in which the Russian company plans to purchase long term Uzbek gas exports and participate in PSAs. In December 2006, Gazprom received exploration licenses from Uzbekneftegaz to develop 7 gas blocks with combined reserves of 35 Tcf (1 Tcm). Gazprom expects to invest $400 million by 2011 and $1.5 billion over the contract life. The companies will pump between 480 and 580 Bcf/y (13.6 and 16.4 bcm/y) of gas from the fields. In 2004, the two parties signed a $15 million, 15-year PSA to develop the Shakhpati field in

northwestern Uzbekistan. The field has an estimated 272 Bcf (7.7 Bcm) of reserves. Lukoil, another Russian energy company, signed a 35-year, $3 billion PSA with Uzbekneftegas in June 2004 to develop the Khauzak and Kandym natural gas deposits, estimated to hold roughly 8 Tcf (250 Bcm) of natural gas. The company hopes to begin producing around 210 Bcf/y (6 bcm/y) beginning in 2011.

Asian companies such as Petronas are also part of a consortium including Lukoil, CNPC, and South Korea's KNOC to explore Uzbekistan's sector of the Aral Sea and central Ustyurt plateau. The parties signed a 35-year PSA in late 2006 and estimate reserves at roughly 14 Tcf (0.4 Tcm). Also, Daewoo International (Korea) signed a contract in 2008 to operate fields in northwestern Uzbekistan for 5 years. China signed an accord with Uzbekneftegas in May 2007 to participate in a joint gas exploration project in the eastern Namangan province.

Natural Gas Exports

In 2006, Turkmenistan exported approximately 1.66 Tcf/y (46 Bcm/y), most of which are contracted to Russia (around 1.4 Tcf/y (40 Bcm/y) and subsequently sold to Ukraine. After a pricing dispute which halted Turkmenistan's natural gas exports in late 2004, Turkmenistan re-negotiated the quantities and prices of its natural gas exports to Russia and Ukraine. Turkmenistan's September 2006 agreement with Russia guarantees initial natural gas exports of 212 bcf/y (6 Bcm/y) in 2005, increasing to 1.8 Tcf/y (50 Bcm/y) in 2007 and up to 2.8 Tcf/y (80 Bcm/y) from 2009-2028. The exact volumes in the agreements are not transparent, although press reports indicate deliveries to Gazprom (Russia) will range from 2.1-2.5 Bcf/y (60-70 Bcm/y) in 2009, 1.5-1.8 Bcf/y (42-51 Bcm/y) of which will go to Ukraine. Turkmenistan is not supplying gas to Ukraine directly in 2006 but rather to RosUkrEnergo, the intermediary in the Russia-Ukraine gas deal reached in January 2006. The company has already signed contracts for 1.5 Tcf/y (42 Bcm/y) of gas with Turkmenistan, 300 Bcf/y (8.5 Bcm/y) with Kazakhstan, and 247 Bcf/y (7 Bcm/y) with Uzbekistan for 2007. In November 2007, Gazprom agreed to raise the price it pays for gas imports from Turkmenistan to $3.68 per Mcf ($130 per Mcm) and $4.25 per Mcf ($150 per Mcm) for the first and second half of 2008, respectively, representing a 50 percent increase from the 2007 price level. Gazprom passed on this price increase to Ukraine in late 2007.

The remaining exports go to Iran. Iran's imports from Turkmenistan were 212 Bcf/y (6 Bcm/y) in 2006 according to the National Iranian Gas Company. By 2008, Iran is slated to increase these gas imports to 494 Bcf/y (14 Bcm/y). Iran and Turkmenistan have held price negotiations, but Iran continues to pay $2.12 per Mcf ($75 per Mcm), about half of what Russia now pays for Turkmen gas. However, the gas dispute between Turkmenistan and Iran in January 2008, when the former cut supplies to the latter, could lead to Iran paying higher prices for Central Asian gas.

Turkmenistan, eager to boost gas exports and hydrocarbon revenues, signed several agreements during 2007 with international parties interested in tapping into its gas reserves and developing pipeline infrastructure to facilitate flows. Based on current agreements signed with various countries, the new Turkmen government envisaged raising gas exports in 2007 by 25 percent to 2.05 Bcf/y (58 Bcm/y) from 2006 levels. However, preliminary estimates of 2007 production are lower than the government's original goal of 2.8 Bcf/y (80 Bcm/y). Likewise, export volumes could be lower than projected.

In pursuit of new export markets in Asia, Berdymukhammedov renewed the 2006 gas export agreement his predecessor Niyazov made with China. In July 2007, CNPC signed an agreement to transport 1.1 Tcf/y (30 Bcm/y) of gas from Turkmenistan (600 Bcf/y (17 Bcm/y) from the new fields in the Yolotan and 460 Bcf/y (13 Bcm/y) from the Bagtyyarlyk field) for 30 years. This gas import deal with Turkmenistan is linked to a production sharing agreement allowing the Chinese company to develop gas fields in the northeast as well as construct a pipeline across Central Asia to China. PetroChina's deputy manager of pipelines and gas, Hou Chuangye, recently announced that China intends to pay $5.52 per Mcf ($195 per Mcm) for the gas. This price is higher than the industry expected and could provide Turkmenistan with greater leverage in contract negotiations with other buyers.

Uzbekistan exported approximately 450 Bcf/y (12.7 Bcm/y) during 2006, up nearly 10 percent from 2005. Uzbekistan sends over half of its natural gas exports to Russia and the remainder to neighboring Central Asian states. Uzbekistan serves as a transit point for Turkmenistan's gas exports to Russia, which are pumped through Kazakhstan. The gas enters the Russian territory at the Alexandrov Gay point, the entrance to the Central Asia-Central Russia line. According to Uzbekneftegaz, the country planned to boost gas exports in 2007 to 512 Bcf/y (14.5 Bcm/y), up 14 percent from 2006 levels and hopes to export gas to China after the Turkmenistan to China pipeline is constructed. Uzbekistan plans to upgrade its gas infrastructure and export 565 Bcf/y (16 Bcm/y) by 2014 according to *Asia Pulse* (June 30, 2006). Following suit with neighboring Turkmenistan, Uzbekistan raised gas export prices for Russia by 50 percent to $4.25 per Mcf ($150 per Mcm) in the second half of 2008 and for Tajikistan and Kyrgyzstan by 45 percent to $4.11 per Mcf ($145 per Mcm) in 2008. Unlike Turkmenistan, Uzbekistan consumes a high

percentage of its gas production for domestic use which averaged nearly 80 percent over the past decade. The country has the highest population in Central Asia - 27 million in 2007; therefore export capabilities are limited.

Natural Gas Pipeline Routes

Central Asia's main natural gas export pipeline, the Central Asia-Center (CAC) pipeline, already is routed into the Russian natural gas pipeline system, as is the Bukhara-Urals pipeline. In an effort to diversify export routes, a number of natural gas pipelines originating in Central Asia are under consideration. Central Asia also has a number of internal pipelines, including the Tashkent-Bishkek-Almaty pipeline, to serve natural gas customers in the region. Maximum existing gas export capacity from Turkmenistan and Uzbekistan is less than 3.5 Tcf/y (100 Bcm/y), which is less than the combined current gas production (4.5 Tcf/y or 126 Bcm/y). As both countries seek to increase production and exports, they will need to refurbish existing infrastructure as well as build new pipelines.

Central Asia-Center Pipeline

The Central Asia-Center pipeline is the key route through which Central Asia exports its gas to Russia and Gazprom's natural gas system takes gas to European markets. The western branch delivers Turkmen natural gas from near the Caspian Sea region to the north, while the eastern branch pipes natural gas from eastern Turkmenistan and southern Uzbekistan to western Kazakhstan where the branches meet in route to the Russian gas pipeline system. Turkmenistan has been the chief exporter of natural gas via the Central Asia-Center pipeline, and over 90 percent of the country's natural gas exports on the CAC system transit the eastern branch. Both branches have a combined design capacity of 3.53 Tcf/y (100 Bcm/y); however because of the poor technical conditions, actual capacity is at best 2.3 Tcf/y (65 Bcm/y) according to Global Insight.

In May 2007, Turkmenistan along with Kazakhstan and Russia signed an intergovernmental accord to invest in refurbishing the Central Asian-Center pipeline as well building a new pipeline along the Caspian's eastern coast via Kazakhstan. Russia plans to reconstruct the western branch and build a parallel pipeline, costing up to US$1 billion, along the Caspian shore to increase system capacity from 141 Bcf/y (4 Bcm/y) to 706-1,060 Bcf/y (20-30 Bcm/y). The agreement would include Uzbekistan in restoring capacity on the deteriorated eastern branch from around 1.77 Tcf/y (50 Bcm/y) back to 3.18 Bcf/y (90 Bcm/y) by 2009. Details on the financial structure of the deals and investment in gas production are still unclear.

Korpezhe-Kurt Kui Pipeline

This 200 kilometer pipeline was built in 1997 and was the first Central Asia natural gas pipeline to bypass Russia. With a capacity of almost 477 Bcf/y (13.5 Bcm/y), Turkmenistan has been able to supply Iran with roughly 212 Bcf/y (6 Bcm/y) of natural gas per year. The terms of the 25-year contract between the two countries stipulates that 35 percent of Turkmen supplies are allocated as payment for Iran's contribution to building the pipeline. In February 2007, Turkmenistan installed a new $120 million gas processor to facilitate higher natural gas flows to Iran. At the beginning of 2008, Turkmenistan ceased sending supplies to Iran.

Central Asia Gas Pipeline (Turkmenistan to China)

CNPC and PetroChina established the Sino-Turkmenistan Gas Pipe Corporation to construct a 2,582-kilometer, 1,060 Bcf/y (30 Bcm/y) gas export pipeline from the Amu Dar'ya fields in Turkmenistan to Urumqui in western China and the interconnection with China's West-East pipeline. CNPC signed agreements with Turkmenistan, Uzbekistan and Kazakhstan for this phase of the pipeline. The estimated cost for this project is $14 billion (102 billion yuan), to be solely financed by CNPC. Pipeline construction began in 2007 and is anticipated to come online in 2010. The A construction contract for the Turkmen section of the pipeline was awarded to Stroitransgas, a Russian company.

Bukhara-Urals Pipeline

Lack of maintenance on the CAC caused Uzbekistan to re-open the moth-balled Bukhara-Urals Pipeline in 2001 to transit increasing volumes of Turkmen gas. The pipeline capacity is currently 706 Bcf/y (20 Bcm/y). The modernization cost to re-open the pipeline was around $20 million, and Marubeni (Japan) is slated to participate in a $100 million renovation project for the pipeline.

Trans-Afghan Pipeline

An additional way for Caspian region exporters to supply Asian demand would be to pipe oil and natural gas south through Iran to the Persian Gulf or southwest to Afghanistan. The Afghanistan option, which Turkmenistan has been promoting, would entail building pipelines across war-ravaged Afghan territory to reach markets in Pakistan and possibly India. With the overthrow of the Taliban government in Afghanistan in December 2001, proposals to build a Trans-Afghan natural gas pipeline have re-emerged. The Trans-Afghan pipeline, also called the Turkmenistan-Afghanistan-Pakistan (TAP) pipeline, would span over 1,000 miles from a point in Turkmenistan to Fazilka (India) on the Pakistan-India border and have a proposed capacity of 700 Bcf/y (20 Bcm/y). Construction cost is estimated at $3 billion or higher. A feasibility study, commissioned by the Asian Development Bank, was completed in 2005. The lack of an international investor, independent verification of Turkmenistan's gas reserves, and security concerns have kept construction from beginning.

Tashkent-Bishkek-Almaty Pipeline

Uzbekistan's main natural gas export pipeline has been the Tashkent-Bishkek-Almaty pipeline which runs through northern Kyrgyzstan to southern Kazakhstan and has a capacity of 159 Bcf/y (4.5 Bcm/y). The pipeline is the main source of natural gas for Kyrgyzstan and southern Kazakhstan. Irregular supplies from Uzbekistan, illegal tapping of the pipeline by Kyrgyzstan claimed by Kazakhstan, and mounting debts by both Kazakhstan and Kyrgyzstan for supplies already received have led to increased tension between the three neighbors in the past.

Trans-Caspian Pipeline (TCGP)

A proposal to build the Trans-Caspian Pipeline would bypass both Russia and Iran to carry Turkmen gas across the Caspian Sea to Azerbaijan and connect with pipelines en route to Europe. This proposed 30 Bcm pipeline could connect to the South Caucasus pipeline flowing gas to Turkey and then to the planned Nabucco pipeline to southeastern Europe. Despite the May 2007 agreement with Russia and Kazakhstan, Turkmenistan is receptive to advancing both deals. Disputes over Caspian seabed jurisdiction between Turkmenistan and Azerbaijan could complicate the project's viability.

Links

EIA Links
EIA: Country Information on Azerbaijan
EIA: Country Information on Iran
EIA: Country Information on Kazakhstan
EIA: Country Information on Russia
Oil and Gas Resources of the Ferghana Basin-EIA

U.S. Government
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Heren Energy
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